Remarks

Claims 1-4, 7-30, 33-35, and 54-60, 62, and 63 are pending. Claims 1, 55, and 56 are the independent claims.

Amendments to the claims

Claim 56 has been amended to incorporate the limitation of previous claim 61. Claim 61 has been cancelled. Support for this amendment is found in the original specification, particularly at paragraph 74 of the published application.

Claims 62 and 63 have also been amended to more clearly recite the claimed invention consistent with the amendment to claim 56.

No new matter is added.

Interview

Applicant thanks the Examiner for the September 9, 2010 interview. During the interview, the Examiner and the undersigned discussed the prior art (Santini, Sheppard, and Gordon) and pending claims 1, 55, and 56. The undersigned explained how neither Santini, Sheppard nor Gordon disclose structures that electrothermally ablate. Specifically, it was shown how Santini can not disclose electrothermal ablation because electric current is not conducted through the reservoir cap itself; instead Santini discloses conducting current through a nearby resistor. It was explained that, in order for a reservoir cap to electrothermally ablate, the reservoir cap material must conduct current and then ablate due to intrinsic resistive heating of the reservoir cap material. In addition, it was argued that Santini does not disclose input and output leads that are electrically connected to the reservoir cap or that lead to and from the reservoir cap. Instead, Santini discloses leads that are connected to a resistor near the reservoir cap, and the resistor is a separate and distinct element from the cap. Finally, it was argued that Santini does not disclose a reservoir cap that conducts electricity as part of its rupture. Instead of disclosing eletrothermal ablation, Santini discloses conducting current through a resistor (which does not serve as a reservoir cap) and the resistor generates heat which is then *thermally conducted* to the reservoir cap material to cause the material to melt.

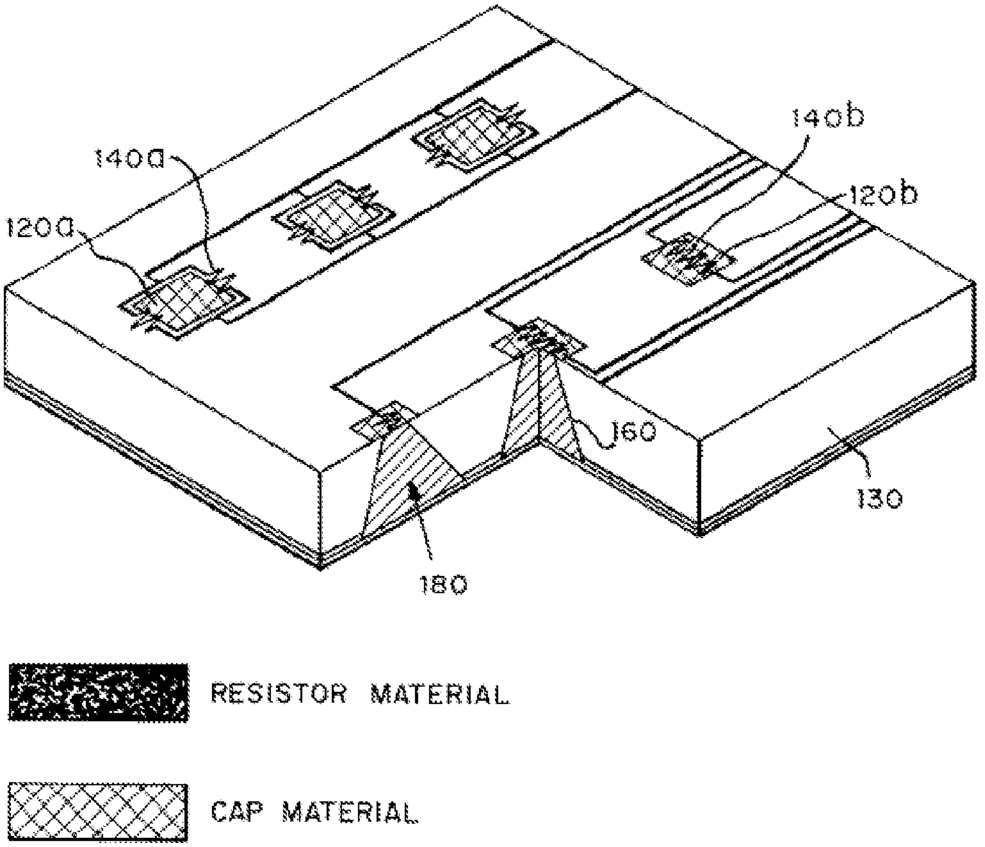
The Examiner acknowledged that Santini does not disclose input and output leads that are *electrically* connected to the reservoir cap since current is not conducted through the reservoir cap but is conducted through the resistor. Sheppard and Gordon were also discussed, and the Examiner acknowledged that Sheppard and Gordon do not disclose the claimed structure for electrothermal ablation of a reservoir cap. The Examiner suggested that these arguments be clearly made on the record.

Rejections Under 35 U.S.C. § 102(e)

Claims 1, 26-27, 29-30, 33, 55, 56, and 60-63 are rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,527,762 to Santini, Jr. et al. ("Santini"). The rejection is respectfully traversed.

The Office Action alleges that Santini discloses a resistor "in the cap" and that the resistor comprises "platinum or gold" and "[t]herefore, Santini, Jr. [] discloses a reservoir cap that is considered metal, since it possess some metal (i.e., the gold or platimum)." [Office Action, pages 2-3]. Santini's reservoir cap and resistor are two distinct components, however.

As can be clearly seen in FIG. 5 of Santini, which is reproduced below, the reservoir cap material and reservoir material are not the same and are clearly illustrated as being separate.



Furthermore, Santini discloses "[in FIG. 5], three reservoirs are provided with resistors 140a positioned near reservoir caps 120a, while the other three reservoirs are provided with resistors 140b positioned on top of reservoir caps 120b." [Col. 24, lns. 39-43]. Similarly, Santini describes "FIG. 9C shows resistor 912 on top of or just below reservoir cap 916 covering reservoir 914." Thus, the resistor and reservoir cap are clearly different components in Santini. The resistor does not serve the function of a reservoir cap and one of ordinary skill in the art would not consider the resistor a reservoir cap. Based on the foregoing, Santini does not disclose

(1) *electrically-conductive* reservoir caps, and (2) input and output leads that are electrically connected *to the reservoir cap*.

In addition, Santini does not disclose a means for disintegrating the reservoir caps *by electrothermal ablation*. As explained in the Declaration under 37 C.F.R. 1.132 by John Santini, electrothermal ablation "is analogous to the failure of a conventional electrical fuse." (Paragraph 3). As explained in Applicants' specification, electrothermal ablation involves a phase change that is "***caused by the generation of heat within the reservoir cap as a result of electric current flowing through the reservoir cap.***" [November 8, 2006 amendment to the specification, emphasis added]. Santini does not disclose passing current through the reservoir cap; it discloses passing current through a resistor adjacent to the reservoir cap. Moreover, Santini does not disclose a phase change of the reservoir cap that is caused by intrinsic resistive heating.

For each of the foregoing reasons, the rejection should be withdrawn.

Rejections Under 35 U.S.C. § 103

Claims 1-4, 7-14, 16-24, 29-30, 33-34, and 55-63 are rejected under 35 U.S.C. 103(a) as obvious over Sheppard (U.S. Patent Publication No. 2002/0072784) in view of Gordon (U.S. Patent No. 6,349,232). Claims 26-28 are rejected under 35 U.S.C. § 103(a) as obvious over the "modified Sheppard." Claims 15 and 54 are rejected under 35 U.S.C. § 103(a) as obvious over the "modified Sheppard" further in view of Fischell et al. (U.S. Patent No. 6,112,116). Claim 35 is rejected under 35 U.S.C. § 103(a) as obvious over the "modified Sheppard" further in view of Theeuwes et al. (U.S. Patent No. 6,726,920). The rejection is respectfully traversed.

Neither Sheppard nor Gordon disclose or suggest disintegration of a reservoir cap via electrothermal ablation as more particularly defined by Applicants' claims. As explained above, electrothermal ablation is analogous to the failure of a conventional fuse and involves a phase change caused by the generation of heat within the reservoir cap as a result of electric current flowing through the reservoir cap.

The most relevant portions of Sheppard are paragraphs [0026] and [0027] which, when considered together, describe three different mechanisms for opening a reservoir. Paragraph [0026] describes one mechanism of opening the reservoir – oxidation and dissolution of an anode-type reservoir cap. This mechanism does not involve electrothermal ablation. That is, the reservoir cap does not rupture or disintegrate due to internal resistive heating, rather it disintegrates via a chemical oxidation reaction followed by dissolution of the oxidized material.

Paragraph [0027] principally describes two additional mechanisms of release – (1) melting a "thermally-responsive polymer" using a "nearby" resistor, and (2) modulating the porosity or integrity of an "electrically-responsive polymer." Regarding Sheppard's disclosure of using a "thermally-responsive polymer," this disclosed mechanism does not anticipate any of the present claims because electric current is transmitted through the "nearby" resistor and not through the reservoir cap itself. Nothing in paragraph [0027] teaches that the reservoir cap is electrically-conductive and is designed to disintegrate by intrinsically-generated heat.

Gordon does not add anything to Sheppard; Gordon discloses essentially the same mechanism as paragraph [0027] of Sheppard – melting a thermally responsive polymer using a nearby resistor. As in Sheppard, Gordon's resistor is discrete from the reservoir cap/enclosure. Gordon's resistive heating element generates heat, and the heat is transferred from the resistive heating element to the enclosure to melt the enclosure. See Col. 10, Lns. 3-8, and Col. 8, Ln. 57 to Col. 9. In an exemplary embodiment, Gordon uses a *resistance heating element* **272** placed against the outer surface of or imbedded in a cell enclosure **270**, as illustrated in FIGS. 9, 10, and 11A-C. See Col. 3, Line 58 to Col. 4, Line 2. Significantly, **the resistive heating element is a *distinct* structure from the cell enclosure**.

In contrast, Applicants' claimed devices utilize an electrically conductive reservoir cap that is heated by *intrinsically-generated heat* caused by passage of an electrical current through the reservoir cap *itself*. The intrinsic heating is sufficient to ablate the reservoir cap (i.e., electrothermal ablation) thereby exposing the reservoir opening over which the reservoir cap previously existed. This is different from Gordon's teaching of the use of a *separate* heating element. Gordon does not teach that a discrete reservoir cap *itself* can serve as the heating element.

Furthermore, it is noted that the embodiment illustrated in FIG. 11D of Gordon does not undergo electrothermal ablation. Gordon does not disclose that the enclosure is ablated by the current passing through the enclosure. Instead, Gordon discloses that the cell is "energized" by current. Col. 9, lines 44-49. Thus, in FIG. 11D, Gordon discloses an embodiment in which an enclosure is energized to become permeable to the substance contained therein. See Col. 9, Lines 9-17.

In summary, the cited prior art discloses the following structures and mechanisms for releasing content from a reservoir:

- An anode reservoir cap material that disintegrates via chemical oxidation when an electric potential is applied between a cathode and the reservoir cap (*Sheppard*, Col. 4, lns. 21-29);
- A reservoir cap (Sheppard) or enclosure (Gordon) comprising an *electrically-responsive* polymer whose integrity or porosity (Sheppard) or permeability (Gordon) can be modulated by application of electric energy to the cap/enclosure (*Sheppard*, Col. 4, lns. 30-34; *Gordon*, FIG. 11D and Col. 9, lines 9-17);
- A reservoir cap (Sheppard/Santini) or an enclosure (Gordon) comprising a *thermally-responsive* polymer whose integrity can be modulated/ruptured by application of electrical energy to a *nearby* resistor and not the cap itself (*Sheppard*, Col. 4, lns. 30-36; *Santini*, FIGs. 5 and 9C; *Gordon*, FIGs. 10, 11A, 11B, 11C); and
- A reservoir cap comprising a polymer whose porosity can be modulated by application of electromagnetic energy, acoustic energy, or a particular chemical species (*Sheppard*, Col. 4, lns. 36-40).

As such, the cited prior art does not disclose reservoir caps that electrothermally ablate or electrically-conductive reservoir caps that are electrically connected to input and output leads. Also, Sheppard and Gordon do not teach or suggest a structure (e.g., a reservoir cap) that serves *both* as a resistive heating element *and* as the structural boundary between the reservoir contents and outer environment. The Examiner has not provided any sound technical reason why one of ordinary skill in the art would have been motivated to apply electrical energy through the reservoir cap itself to electrothermally ablate the reservoir cap in view of the fact that both

Sheppard and Gordon disclose using a separate, discrete resistive heating element to melt the cap or enclosure. Accordingly, the Examiner has failed to establish a *prima facie* case of obviousness.

Claim 55

With respect to claim 55 which recites that the reservoir cap is "metal," the Examiner cites paragraph [0046] of Sheppard which references metal film reservoir caps. The referenced metal films are anode-type caps. These caps do not undergo electrothermal ablation; that is, the anode-type caps do not ablate due to intrinsic resistive heating of the reservoir cap material. Furthermore, claim 55 recites that the input and output electrical leads are *electrically connected* to the reservoir caps. Thus, Sheppard's disclosure of conducting current to a nearby resistor to melt the reservoir cap does not disclose this limitation. As such, claim 55 is not obvious over Sheppard in view of Gordon.

Claim 56

Claim 56 has been amended to more particularly recite that "the reservoir cap and the conducting leads to and from the reservoir cap provide upon the application of electrical current *an increase in electrical current density in the reservoir cap relative to the current density in the conducting leads to and from the reservoir cap*." This specific mode of electrothermal ablation is clearly not disclosed by the cited prior art.

Conclusions

Applicants respectfully submit that the claims are patentable over the prior art of record. Prompt allowance of each of claims 1-4, 7-30, 33-35, and 54-60, 62, and 63 is therefore respectfully solicited.

The undersigned kindly invites the Examiner to contact him by telephone (404.853.8066) if any outstanding issues can be resolved by conference or examiner's amendment.

Respectfully submitted,

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